

State Route M-139 Bridge  
State Route M-139 Over Ox Creek  
Benton Township  
Berrien County  
Michigan

HAER No. MI-46

HAER  
MICH,  
11-BENT,  
1-

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD  
MID-ATLANTIC REGION, NATIONAL PARK SERVICE  
DEPARTMENT OF THE INTERIOR  
PHILADELPHIA, PENNSYLVANIA 19106

HAER  
MICH,  
11-BENT,  
1-

# HISTORIC AMERICAN ENGINEERING RECORD

## STATE ROUTE M-139 BRIDGE

HAER No. MI-46

**Location:** Spanning Ox Creek, Benton Township,  
Berrien County, Michigan

**USGS Benton Harbor Quadrangle**  
**UTM:** 16.5468000.4660750

**Date of Construction** 1936, 1969

**Engineer, Builders** Michigan State Highway Department;  
Wisconsin Bridge and Iron Company,  
Carl Goodwin & Sons, Inc.

**Present Owner:** Michigan Department of Transportation  
425 West Ottawa, P.O. Box 30050  
Lansing, Michigan 48909

**Present Use:** Vehicular and Pedestrian Traffic

**Significance:** This is a good example of a mid-sized viaduct structure designed to bridge an area with unstable subsoil conditions. The use of reinforced-concrete piers and abutments in combination with a steel girder superstructure is an unusual design. The concrete piers extend beyond the main girders, so that much of the deck is cantilevered.

**Project Information:** This documentation was undertaken in November, 1990 in accordance with the Memorandum of Agreement by the Federal Highway Administration, the Michigan Department of Transportation, the State Historic Preservation Officer, and the Advisory Council on Historic Preservation as a mitigative measure prior to the demolition of the bridge.

Dr. Charles K. Hyde, Department of  
History, Wayne State University  
Detroit, Michigan 48202

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The State Route M-139 Bridge carries a state highway built in the 1930s through what was a largely undeveloped area more than a mile south of downtown Benton Harbor, Michigan. After the Pere Marquette Railroad abandoned its line running southwest from Benton Harbor to Berrien Springs in the mid-1920s, Berrien County took over the Pere Marquette's bridge over the St. Joseph River, some four miles southeast of Benton Harbor and agitated for a state highway for this area. The Michigan State Highway Department, under Commissioner Grover C. Dillman (1929-1933), built a new concrete highway, M-139, which extended north from Scottdale to Pipestone Road just south of Ox Creek and used the former railroad bridge. Dillman's successor, State Highway Commissioner Murray D. Van Wagoner (1933-1940) decided to bridge the Ox Creek valley and extend M-139 one additional mile to Fair Avenue, which in turn connected with US-12 at Territorial Road. The long-range plan was to extend M-139 further north to connect with US-31 north of Benton Harbor and thus allow traffic on US-31 between South Haven and Niles, Michigan to bypass the twin cities of St. Joseph and Benton Harbor.<sup>1</sup>

The Michigan State Highway Department decided to build a bridge over the Ox Creek valley because unstable subsoil conditions prohibited building a fill. The size of the valley dictated a viaduct structure. In addition, they wanted a grade separation above the Cleveland, Cincinnati, Chicago and St. Louis Railway line, known locally as the "Big Four Railroad," which ran parallel to Ox Creek. The New York Central Railroad, which owned the Big Four, agreed to allow the project to go forward and to share in some of the expenses. The railroad agreed to relocate telegraph and signal lines and provide any needed additional manpower for railroad operations, all at its own expense.<sup>2</sup>

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The construction of the bridge was a Federal Aid highway project, designed by the Michigan State Highway Department to meet U.S. Bureau of Public Roads standards, with the Federal Government and the State of Michigan sharing the costs on a 50-50 basis. The State Highway Department informed its list of pre-approved contractors of this project, twenty-nine of them requested detailed plans, and eight submitted bids by the 4 September 1935 deadline.<sup>3</sup> The Wisconsin Bridge and Iron Company won the contract with a bid of \$174,761.65. They were required to begin work in the fall of 1935 and complete the entire project by 15 July 1936, including the relocation of the channel of Ox Creek.<sup>4</sup>

Wisconsin Bridge and Iron began cofferdam construction and excavation work on 28 September 1935, commencing at the south abutment and working northward. Starting in mid-October, the contractor began driving hundreds of creosoted piles, 35 feet to 38 feet long, which comprised the foundations for the piers and abutments. Although pile driving continued throughout the winter months, with only a few interruptions during periods of extreme cold or heavy snowfalls, it was not completed until late April 1936, at the northern bridge abutment.<sup>5</sup> Starting on 6 November 1935, the contractor poured concrete through the early winter months. Wisconsin Bridge & Iron built temporary housings around the forms at the abutments and piers and kept the housings heated to temperatures of between 60 degrees and 75 degrees to facilitate the curing process.<sup>6</sup> The contractor poured the south abutment and the concrete for 4 of the 8 piers in November and December, but then suffered major delays because of extraordinarily cold and snowy weather from January to March 1936. By late February, the concrete work was already two months behind the original construction schedule.<sup>7</sup>

Wisconsin Bridge & Iron requested an extension of the project deadline, citing their inability to assemble a labor force to work under the extreme weather conditions they had faced most of the winter. The State Highway Department agreed to an extension of two months, to 15 September 1936, with no penalty imposed on Wisconsin Bridge.<sup>8</sup>

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Work progressed at a rapid pace once spring weather arrived. All the concrete for the piers and abutments was poured by 23 May 1936 and all the structural steel was erected by 26 June. Pouring the concrete deck continued until 29 July 1936 and the rest of the work, including sidewalks and railing posts, was finished in August. Wisconsin Bridge and Iron Company kept a crew at work throughout August, cleaning up the site and painting the bridge's structural steel.<sup>9</sup> A series of photographs taken at the bridge site by State Highway Department personnel also provide documentation of construction progress.<sup>10</sup>

Benton Harbor's newspaper, The News-Palladium, offered only sketchy reports on the progress of construction.<sup>11</sup> One reporter pointed out that such a strong, large bridge (671 feet long) was required because Ox Creek, a bare trickle in late summer and early fall, often swelled with the spring thaws to fill its shallow valley and cause considerable damage. The paper also noted that while the bridge cost \$175,000, the new segment of M-139 cost an additional \$50,000, and with other improvements, the entire project cost about \$250,000, making this the most costly highway project in Berrien County's history.<sup>12</sup> The last story on the new bridge made the following observations:

It's a beautiful span of gleaming white, this new bridge across the Ox Creek valley. It is supported by a series of concrete arches that support the superstructure and a hundred years from now it will still be standing.<sup>13</sup>

Immediately after Labor Day, 1936, residents of the neighborhood where M-139 connected with US-12 complained to the Benton Harbor city commission and the State Highway Department about the new congestion M-139 brought.<sup>14</sup>

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No major work was done to the bridge until 1968, when the southern half of the structure was widened to allow the addition of a center lane to allow southbound traffic to turn left at Pipestone Road without disrupting the remaining southbound traffic. The bridge reconstruction was the major element of a larger project that included grading, installation of drainage structures, and concrete paving of 1.9 miles of M-139 from Interstate 94 to the bridge, and an additional mile of the same work on Pipestone Road, Napier Road, and Nickerson Avenue where they intersected M-139. The Michigan Department of State Highways announced the project on January 8, 1969, with bids to be opened on February 12, 1969. The State awarded the project to Carl Goodwin & Sons, Inc. of Allegan, Michigan, in the amount of \$2,226,437. The contractor was required to maintain bridge traffic throughout the project, reopen the bridge to regular traffic by November 1969, and have the project entirely finished the following August.<sup>15</sup> Goodwin in turn awarded major subcontracts to the Kagle Construction Company of Lansing, Michigan, for curb and gutter work (\$175,770); to Consumers Asphalt Paving Company of Benton Harbor, Michigan, for bituminous surfacing (\$62,998); and to Moored Construction Company of Hudsonville, Michigan, for guard rails, fencing, sod, and seeding.<sup>16</sup>

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In the 1969 alterations to create a left turn lane for the Pipestone Road intersection, the southwest section of the bridge was widened by only 2 feet 2 inches at pier 4, but by an increasing amount at piers 3, 2, and 1, up to a maximum of 10 feet 7 inches at the south abutment. The south abutment and the four southernmost piers were altered to permit widening of the bridge. The part of the piers that extended beyond the main girders were replaced by new reinforced concrete piers resting on concrete footings. A new welded plate girder 5 feet 5 inches deep extending on a north-south alignment was added at each of the widened spans and connected to the existing girder with diagonal stiffening. The original floor beams, which are perpendicular to the main girders and support the deck and sidewalks, were steel I-beams 21 inches deep by 8 1/4 inches, but were tapered at the outer edge to only 12 inches in depth, to support the sidewalks. These were modified to a consistent depth of 21 inches. The appearance of the bridge was not radically altered because the existing railing panels were salvaged and re-erected, while new parapet walls similar to the old ones were rebuilt at the south abutment. The widening project increased the clear roadway at the south end of the bridge proper from 44 feet to 52 feet, allowing for two 4-foot shoulders, in addition to four 11-foot lanes for traffic. The bridge continues to carry two 6-foot wide sidewalks.<sup>17</sup>

The State M-139 bridge is a nine-span viaduct-type bridge consisting of a steel girder superstructure resting on reinforced concrete piers and footings, which in turn rest on timber piles. Overall, the bridge is 671 feet long, with maximum length of individual spans of 71 feet, center to center.

The abutments originally rested on identical reinforced-concrete footings, each C-shaped and measuring 3 feet deep, 65 feet long, and 22 feet wide overall, with the legs of the "C" each measuring 12 feet 6.5 inches long and 6 feet wide. Each abutment footing is supported by 142 timber piles of 15-ton capacity, each driven between 35 and 38 feet to bedrock. As part of the 1969 widening project, the south abutment footing was enlarged to 75 feet 2 inches long and 22 feet wide overall and was supported by 18 additional 15-ton timber piles.

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The two center piers (Nos. 4 & 5) rest on footings, each measuring 3 feet deep, 65 feet long, and 22 feet wide, with each footing supported by 104 timber piles of 15-ton capacity. The remaining piers (Nos. 1-3 and 6-8) originally rested on footings measuring 3 feet deep, 65 feet long, and 9 feet wide, each supported by 45 timber piles (15-ton) driven to bedrock. The footing for pier 1 was lengthened by 4 feet 6 inches in the 1969 project and 6 additional 15-ton timber piles were driven at that time.

Piers 1, 2, 3, 6, 7, and 8 are reinforced-concrete, with each pier consisting of four vertical columns supporting a horizontal reinforced-concrete beam. The two interior columns are 3 feet square, while the outside columns are 3 feet by 4 feet, and all are placed 16 feet 8 inches apart. The columns, each 22 feet 4 inches in height, support a 4 foot square beam, which is 60 feet long. Each of the two center piers (4 & 5) consists of a pair of linked piers identical to the rest of the bridge piers, except that the outer columns are 5 feet by 3 feet in size. The two are 11 feet apart, but are tied together structurally with a 3 foot square concrete cross beam and visually by the creation of a massive concrete parapet wall 22 feet wide by 19 feet 3 inches high.

The steel superstructure supporting the bridge deck remains as built in 1936 on the north half of the structure, but was modified for the 1969 widening project on the south half. The superstructure originally consisted of four welded steel plate girders for each of the nine spans, each girder 71 feet long, 5 feet 6 inches in depth, placed 15 feet 4 apart, center to center, resting on the concrete girders at each pier or on the abutments, and connected with steel crossbracing to give the structure additional stability. Steel I-beams which rested on, and ran perpendicular to, the plate girders supported the bridge deck and sidewalks. Each span had nine floor beams, placed either 9 feet or 8 feet 5 inches apart. The floor beams, which were 72 feet 2 inches long overall, measured 8 1/4 inches wide and were 21 inches in depth where they supported the roadway, but then tapered to a depth of only 12 inches at the extreme ends, where the floor beams were supporting only the sidewalks.



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The widening of the south half of the bridge in 1969 included two significant changes to the original steel superstructure. A fifth set of welded steel plate girders were added to the extreme western edge of the bridge and the floor beams were built up to a consistent depth of 21 inches throughout.

The balustraded railings, of die-cast of zinc, consist of segments measuring 7 feet 1 inch long by 2 feet 7 inches in height, with thick top and bottom railings surrounding a central panel with numerous lighter spindles. The railing is regularly interrupted by concrete pilasters 3 feet 5 inches in height, 16 inches wide and 12 inches deep. A pair of slightly larger pilasters appear at each of the bridge's four expansion joints.

A single bronze plaque has survived, mounted on the railing at the southeast corner of the bridge. It contains only the most basic information about the bridge, namely that it was a Federal Aid Bridge, the date of completion, contractor's name, and the State Highway Commissioner at the time, Murray D. Van Wagoner.

NOTES

<sup>1</sup>Benton Harbor Newa-Palladium, 2 September 1936, pp. 1, 6.

<sup>2</sup>Agreement, New York Central Railroad Company and the Michigan State Highway Department, 12 September 1935, in Michigan Department of Transportation Records, State of Michigan Record Center, Lot 1651, Box 4, FX2 of 11-2-21, Folder 1.

<sup>3</sup>"Record of Requests for Plans and Proposals" and "Record of Bid Checks," Michigan Department of Transportation Records, State of Michigan Record Center, Lot 1651, Box 4, F X2 of 11-2-21, Folder 1.

<sup>4</sup>Contract, Michigan State Highway Department and the Wiaconsin Bridge & Iron Company, 20 September 1935, Michigan Department of Transportation Records, State of Michigan Record Center, Lot 1651, Box 4, F X2 of 11-2-21, Folder 1.

<sup>5</sup>Michigan State Highway Department, Bridge Division, Daily Conatruction Report, 28 September 1935 - 25 April 1936, MDOT Records, Lot 1651, Box 4, F X2 of 11-2-21, Folder 2. These are particularly valuable documents which delineate in great detail the daily conatruction work, with information on the numbers and occupations of all workers at the job aite.

<sup>6</sup>Michigan State Highway Department, Bridge Concrete Report, 6 November 1935 - 7 August 1936, MDOT Records, Lot 1651, Box 4, F X2 of 11-2-21, Folder 3. These are daily reports from the contractor to the State Highway Department with detailed information on the mix and moiature content of each pour, along with temperature data for the concrete and the aurrounding housing.

<sup>7</sup>Michigan State Highway Department, Bridge Division, Construction Progreesa Report, Period Ending 20 February 1936, MDOT Records, op. cit., Folder 3.

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8"Agreement For Extension of Time For Completion of Contract, Michigan State Highway Department and Wisconsin Bridge and Iron Company, 8 August 1936," in MDOT Records, op cit., Folder 1.

9Michigan State Highway Department, Bridge Division, Construction Progress Report, for period ending 6 August 1936, MDOT Records, op cit., Folder 3.

10Michigan State Highway Department Collection (Record Group 59-17), State of Michigan Archives, Berrien County, X2 of 11-2-21, taken by six different photographers and dated between 1 March 1936 and 9 September 1936.

11Benton Harbor News-Palladium, 7 July 1936, p.1; 2 September 1936, pp. 1, 6; and 5 September 1936, p. 1.

12Ibid., 2 September 1936, pp. 2, 6.

13Ibid.

14Ibid., 9 September 1936, p. 1.

15Michigan Department of Transportation Records, Lot 5601, Box 17, Folder 102, "Contract and Proposal, Contract 69-0279."

16Michigan Department of Transportation Records, Lot 5601, Box 17, Folder 102-3, "Subcontract Agreements."

17"Plans of Proposed Bridge Deck Widening, Niles-St Joseph-Benton Harbor Road," State of Michigan, Department of State Highways, State Project No. U11031, 004, Engineering Drawings, August-December 1968, in the current records of the Michigan Department of Transportation, Lansing, Michigan.

## II. SOURCES OF INFORMATION

A. Architectural Drawings: Engineering Drawings. X2 of 11-2-21 (later, X01 of 11031 B), Michigan Department of Transportation, 425 West Ottawa, Lansing, MI 48909. This is a set of 39 sheets, with sheets 5 through 27 prepared in 1935 and sheets 1 through 4 and sheets 28 through 39 prepared in 1968.

B. Historic Views: A large collection of approximately eighty negatives taken by six Michigan State Highway Department staff members of bridge construction between March and September 1936 have survived in the Michigan State Highway Department Collection, Berrien County, Record Group 59-17, State of Michigan Archives, 717 West Allegan, Lansing, Michigan 48918.

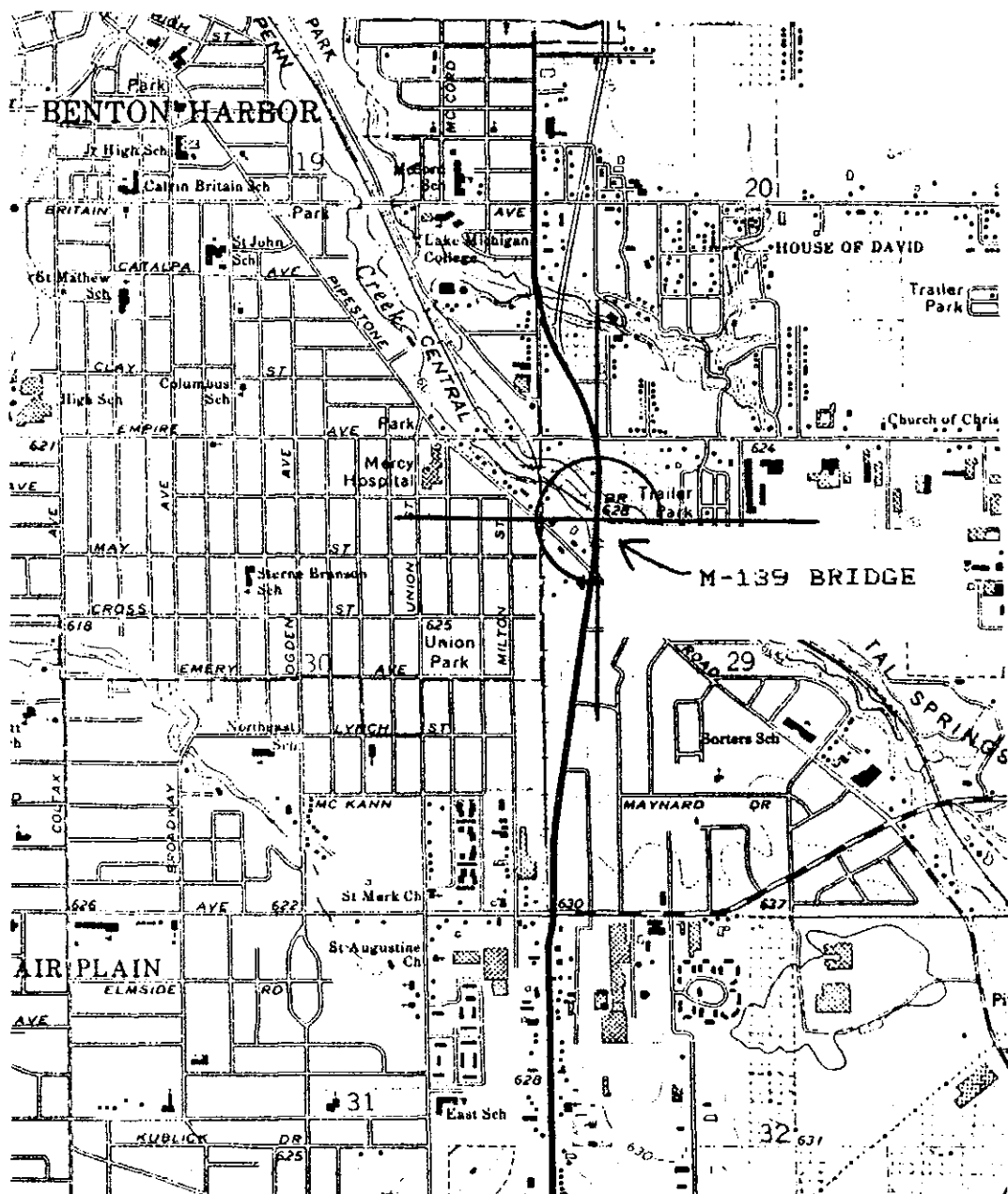
### D. Bibliography

#### 1. Primary and unpublished sources:

Benton Harbor News-Palladium, July-September 1936 and 22 September 1969.

Michigan Department of Transportation Records.  
State of Michigan Record Center, 3405 North Logan, Lansing, Michigan 48918, Lot 1651, Box 4, Folders 1-3 (1935-1936) and Lot 5601, Folders 101-105 (1969-1970).

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STATE M-139 BRIDGE SITE PLAN

